

A Day at the Beach: An Adventure with Volume

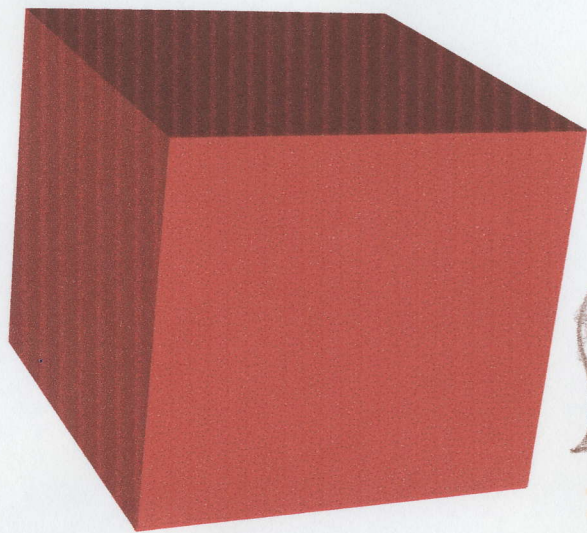


By:
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One day, Miss Shell and her class took a trip to the beach. The kids were excited to get to play in the sand, but Miss Shell had a sneaky lesson planned.



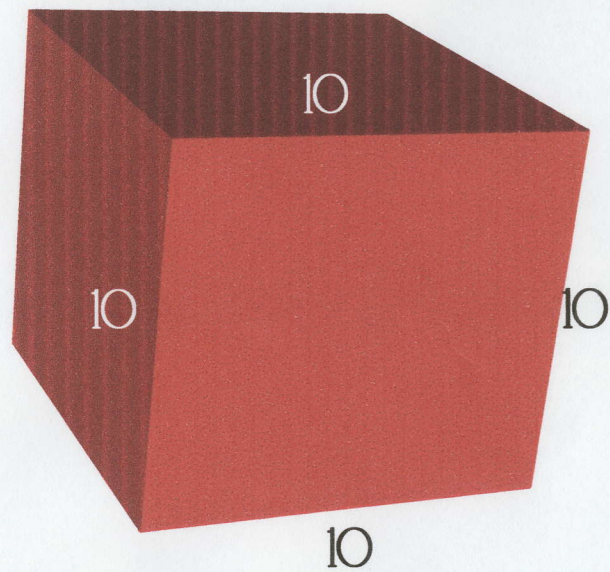
Miss Shell had planned a lesson about volume. She saw the children building sand castles and knew it was the perfect time to start the lesson. "Come in close, kids. Billy, please bring me that bucket." Miss Shell said. "Who knows what this shape is called?" She asked.



It's a
CUBE!!!!



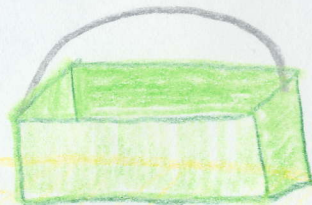
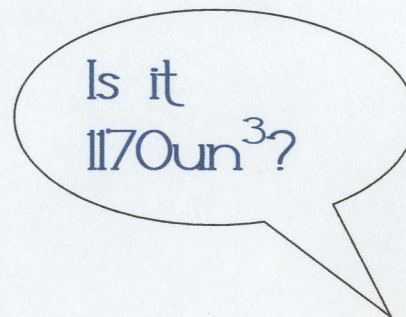
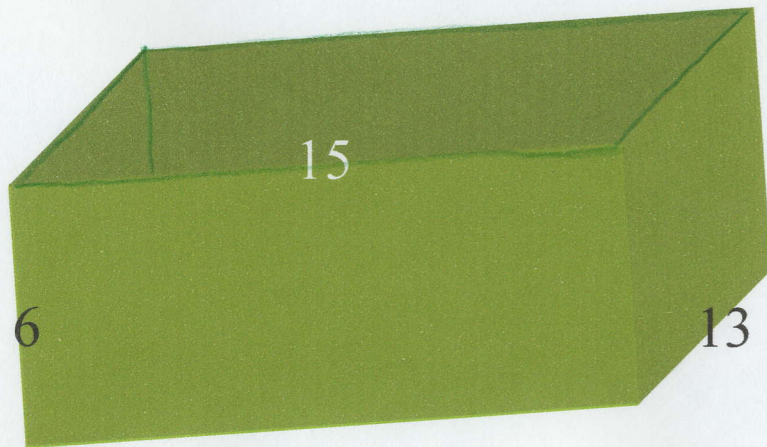
"Very good, Sally." Miss Shell said. "A cube is a 6 sided figure with sides that are all the same length. The sides of this cube are 10 inches long. The amount of sand it will take to fill this bucket is the bucket's *volume*. The way we find the volume is easy. If s is the measure of one side, then we use the formula $V = s \cdot s \cdot s$ to find the volume of a cube. Who can tell me the volume of this cube?"



It's
1000in³!!!!



"Exactly! Now, Jimmy, bring me that bucket over there." Miss Shell asked. "This shape is called a *rectangular prism*. It's bases are rectangles. The way to find the volume of a rectangular prism is $l \cdot w \cdot h$ where l is length, w is width, & h is height. The length of this prism is 15, the width is 13, and the height is 6. Who can tell me the volume?"

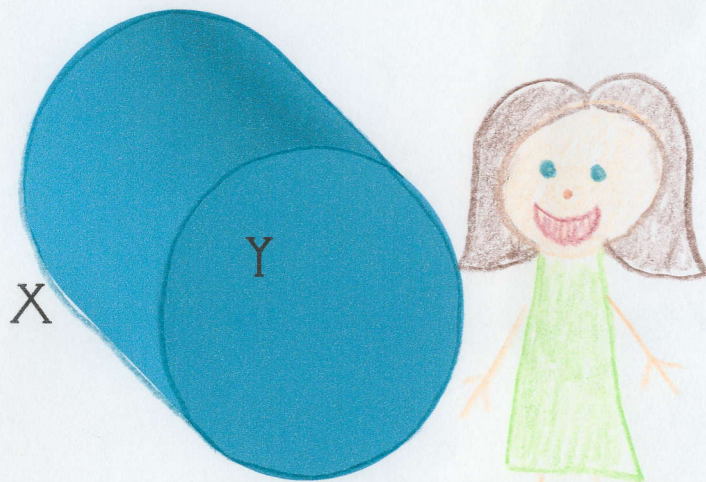


"Why yes, it is! And when we measure volume, we use units cubed (u^3). So the answer is 1170 units^3 . Now that we know the volume of a rectangular prism, let's figure out the volume of a *triangular prism*, which is a prism with triangles for the bases." Miss Shell found a kite shaped like a triangular prism and measured the triangles and the length. "This is simple. Take the area of the base ($\frac{1}{2}bh$) times the height/length of the prism. ($V = A_{\text{BASE}} \cdot \text{Height}$). If the sides of the triangle are 4 inches, and the height is 14 inches, what's the volume of the triangular prism?"



Its 24.25 in^3 !

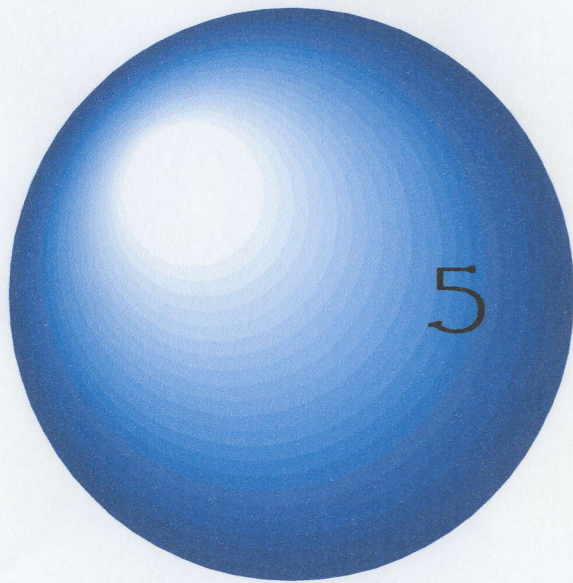
"About that, yes. The next thing is a *cylinder* which is a prism with circles for the bases. The area of a circle is πr^2 , and we take the area of the base times the height for the volume. So, the volume of a cylinder is $\pi r^2 h$. If we have a cylinder with a height of x and a radius of y , what is the volume?"



Its
 $\pi Y^2 X$ un
its³!!



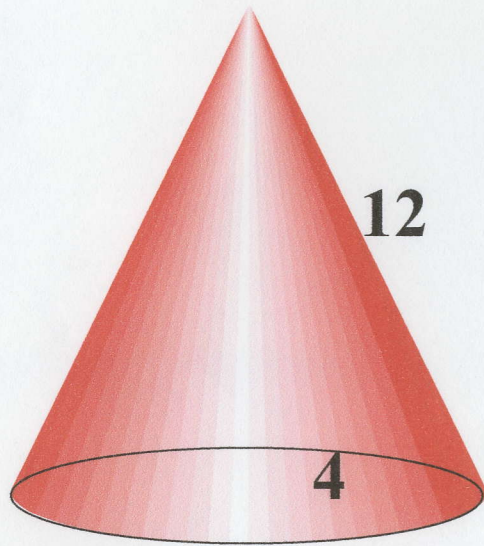
"Yes, it is. Now for something a little different . . . A *sphere*!!!
A sphere is a figure with no lateral edges. The formula to
find the volume of a sphere is $\frac{4}{3}\pi r^3$. Where r is the radius. If
a sphere has a radius of 5, what is the volume?"



Ok, I'll give you
guys this one.
Its 523.6units^3



"This time it's a *cone*. A cone is basically a pyramid with a circular base. The volume of a cone is $\frac{1}{3}A_{\text{base}}H$. If the radius is 4 and the slant height is 12. What's the volume?"



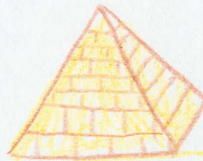
201.1units³!!



"The last shape is a *pyramid*. A pyramid is a figure with a polygonal base and triangular sides. The volume of a pyramid is the same as a cone. $\frac{1}{3}A_{\text{base}}H$. If the base area of a pyramid is 25, and the slant height is 16. What's the volume?"



I know this
one! Its $133\frac{1}{3}\text{units}^3$!



"Today we learned lots of different volume formulas.
Here they are again.

- Cube is side^3
- Rectangular Prism is $\text{length} \times \text{width} \times \text{height}$
- Triangular Prism is $A_{\text{base}} \text{Height}$
- Cylinder is $A_{\text{base}} \text{Height}$
- Sphere is $\frac{4}{3}\pi r^3$
- Cone is $A_{\text{base}} (\text{Slant Height})$
- Pyramid is $A_{\text{base}} (\text{Slant Height})$

Now go off and play before its time to go. And try
measuring the volume of your castles!" Miss Shell said.